

AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth below in marked-up form. A complete listing of all pending claims is presented below.

1. (Currently Amended) A corneal surgery apparatus for ablating a cornea of a patient's eye by irradiation of a laser beam, the apparatus comprising:

an irradiation optical system for irradiating the laser beam onto the cornea;

input means for inputting a first anterior-segment image of the eye picked up in a condition where measurement data for determining corneal ablation data is obtained;

image-pickup means for picking up an image of an a second anterior-segment image of the eye in a condition where the laser beam is irradiated, the second anterior-segment image including images of marks for torsion-detection provided outside an ablation area of the eye;

~~characteristic point detection means for detecting characteristic points common to a the first anterior-segment image of the eye picked up in a condition where measurement data for determining corneal ablation data of the eye is obtained and a the second anterior-segment image of the eye picked up by the image-pickup means, the second anterior-segment image including images of marks for torsion-detection provided outside an ablation area of the eye;~~

mark detection means for detecting the mark images in the second anterior-segment image;

torsion-detection means for obtaining a torsion-error angle of the eye; and

torsion-correction means for correcting the obtained torsion-error angle,

wherein the torsion-detection means obtains, based on the characteristic points in the first anterior-segment image and the characteristic points in the second anterior segment image picked up before the corneal ablation, ~~the~~ a first torsion-error angle that occurred before the corneal ablation,

the torsion-correction means performs any one of rotation of a patient's head and correction of control data on the irradiation optical system so as to correct the obtained first torsion-error angle ~~that occurred before the corneal ablation,~~

the torsion-detection means obtains, based on the mark images in the second anterior-segment image picked up before the corneal ablation after correction of the first torsion-error angle ~~before the corneal ablation~~ and the mark images in the second anterior segment image picked up during the corneal ablation, ~~the~~ a second torsion-error angle that occurred during the corneal ablation, and

the torsion-correction means performs any one of rotation of the patient's head ~~stop of~~ while stopping the irradiation of the laser beam and correction of the control data on the irradiation optical system so as to correct the obtained second torsion-error angle ~~that occurred during the corneal ablation.~~

2. (Cancelled)
3. (Cancelled)
4. (Cancelled)

5. (Previously Amended) The corneal surgery apparatus according to claim 1, further comprising display means for displaying the first and second anterior-segment images,

wherein the characteristic point detection means includes designation means for designating the characteristic points based on the displayed images.

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Currently Amended) A corneal surgery apparatus for ablating a cornea of a patient's eye by irradiation of a laser beam, the apparatus comprising:

an irradiation optical system for irradiating the laser beam onto the cornea;

an input unit which inputs a first anterior-segment image of the eye picked up in a condition where measurement data for determining corneal ablation data is obtained;

an image-pickup unit which picks up an image of an a second anterior-segment image of the eye in a condition where the laser beam is irradiated, the second anterior-segment image including images of marks for torsion-detection provided outside an ablation area of the eye;

a characteristic point detection unit which detects characteristic points common to a the first anterior-segment image of the eye picked up in a condition where measurement data for determining corneal ablation data of the eye is obtained and a the second anterior-segment image of

~~the eye picked up by the image pickup unit, the second anterior segment image including images of marks for torsion detection provided outside an ablation area of the eye;~~

a mark detection unit which detects the mark images in the second anterior-segment image;

a torsion-detection unit which obtains a torsion-error angle of the eye; and

a torsion-correction unit which corrects the obtained torsion-error angle,

wherein the torsion-detection unit obtains, based on the characteristic points in the first anterior-segment image and the characteristic points in the second anterior-segment image picked up before corneal ablation, ~~the~~ a first torsion-error angle that occurred before the corneal ablation,

the torsion-correction unit performs any one of rotation of a patient's head and correction of control data on the irradiation optical system so as to correct the obtained first torsion-error angle ~~that occurred before the corneal ablation,~~

the torsion-detection unit obtains, based on the mark images in the second anterior-segment image picked up before the corneal ablation after correction of the first torsion-error angle ~~before the corneal ablation~~ and the mark images in the second anterior-segment image picked up during the corneal ablation, ~~the~~ a second torsion-error angle that occurred during the corneal ablation, and the torsion-correction unit performs any one of rotation of the patient's head ~~stop of~~ while stopping the irradiation of the laser beam and correction of the control data on the irradiation optical system so as to correct the obtained second torsion-error angle ~~that occurred during the corneal ablation.~~

12. (CANCELED)

13. (New) A corneal surgery apparatus for ablating a cornea of a patient's eye by irradiation of a laser beam, the apparatus comprising:

an irradiation optical system for irradiating the laser beam onto the cornea;

input means for inputting a first anterior-segment image of the eye picked up in a condition where measurement data for determining corneal ablation data is obtained;

image-pickup means for picking up a second anterior-segment image of the eye in a condition where the laser beam is irradiated, the second anterior-segment image including images of marks for torsion-detection provided outside an ablation area of the eye;

first correction means for detecting characteristic points common to the first anterior-segment image and the second anterior-segment image which is picked up before the corneal ablation, obtains a first torsion-error angle that occurred before the corneal ablation based on the detected characteristic points, and performs any one of rotation of a patient's head and correction of control data on the irradiation optical system so as to correct the obtained first torsion-error angle; and

second correction means for obtaining a second torsion-error angle that occurred during the corneal ablation based on the mark images in the second anterior-segment image picked up before the corneal ablation after correction of the first torsion-error angle and the mark images in the second anterior-segment image picked up during the corneal ablation, and performs any one of rotation of the patient's head while stopping the irradiation of the laser beam and correction of the control data on the irradiation optical system so as to correct the obtained second torsion-error angle.